Development and Visualization of Community Vulnerability Indicators for Tracking

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Why examine community vulnerabilities?

- Factors such as community stress, lack of community resources, and other structural factors may play a role in increasing susceptibility to the effects of environmental hazards. (Gee, et al., EHP, **112**(17):1645 2004)

- Interaction between environmental hazards and community vulnerability factors can have profound, directly measurable effects on health outcomes (Northridge, et al., AJPH, 2003. **93**(2):209)

Why examine community vulnerabilities?

- Minority neighborhoods have higher rates of morbidity, mortality, and risk factors for env.-related diseases, even after controlling for income.

- Implications for environmental justice and environmental health disparities
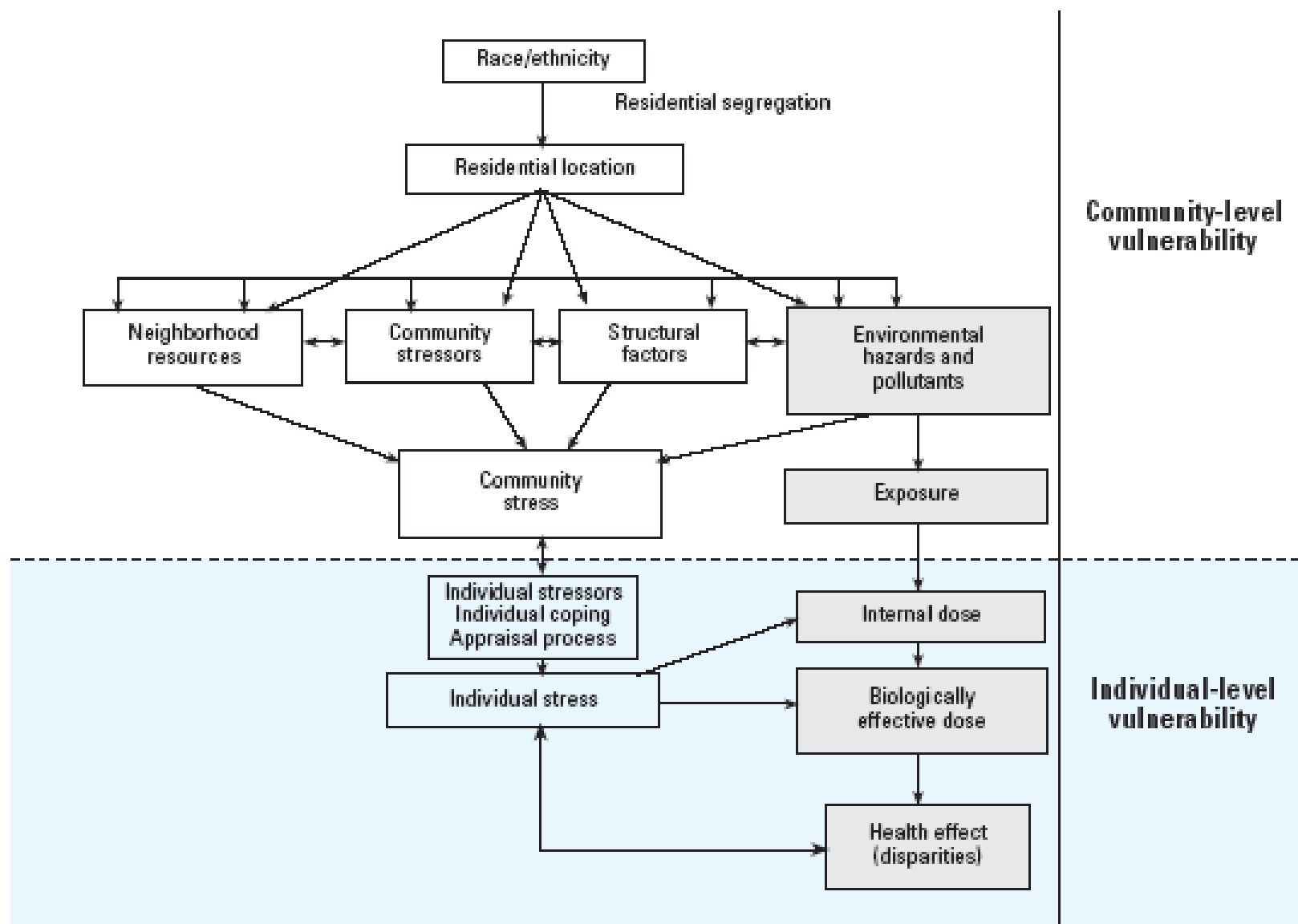
Figure 1. Exposure–disease–stress model for environmental health disparities.

(From Gee, et al. EHP, 2004)

Potential candidates for measuring community vulnerabilities

- Proportion of substandard housing (code violations);
- Income
- Proportion of community green space
- Tobacco/alcohol ads
- Violent crime rates/property crimes from local enforcement agencies;
- Density of liquor stores, stores with fresh food
- density of hospitals and clinics in neighborhoods
 - (physician-nurses per capita).

Potential candidates

- measures of segregation (index of dissimilarity); "differential distribution of the subject population." 0-100: percentage of group that would have to move to integrate two groups over a region as a whole.
- "Good", "Bad" effects of segregation:
- Segregation associated with:
    - Smoking rates   - infant mortality
    - Air pollution   - homicide
    - Concentrates political power   - social support

Fig. X: Distribution of African-Americans and Whites in Orange County, CA showing evenness of population distribution. U.S. Census 2000, Geography Division, U.S. Census Bureau
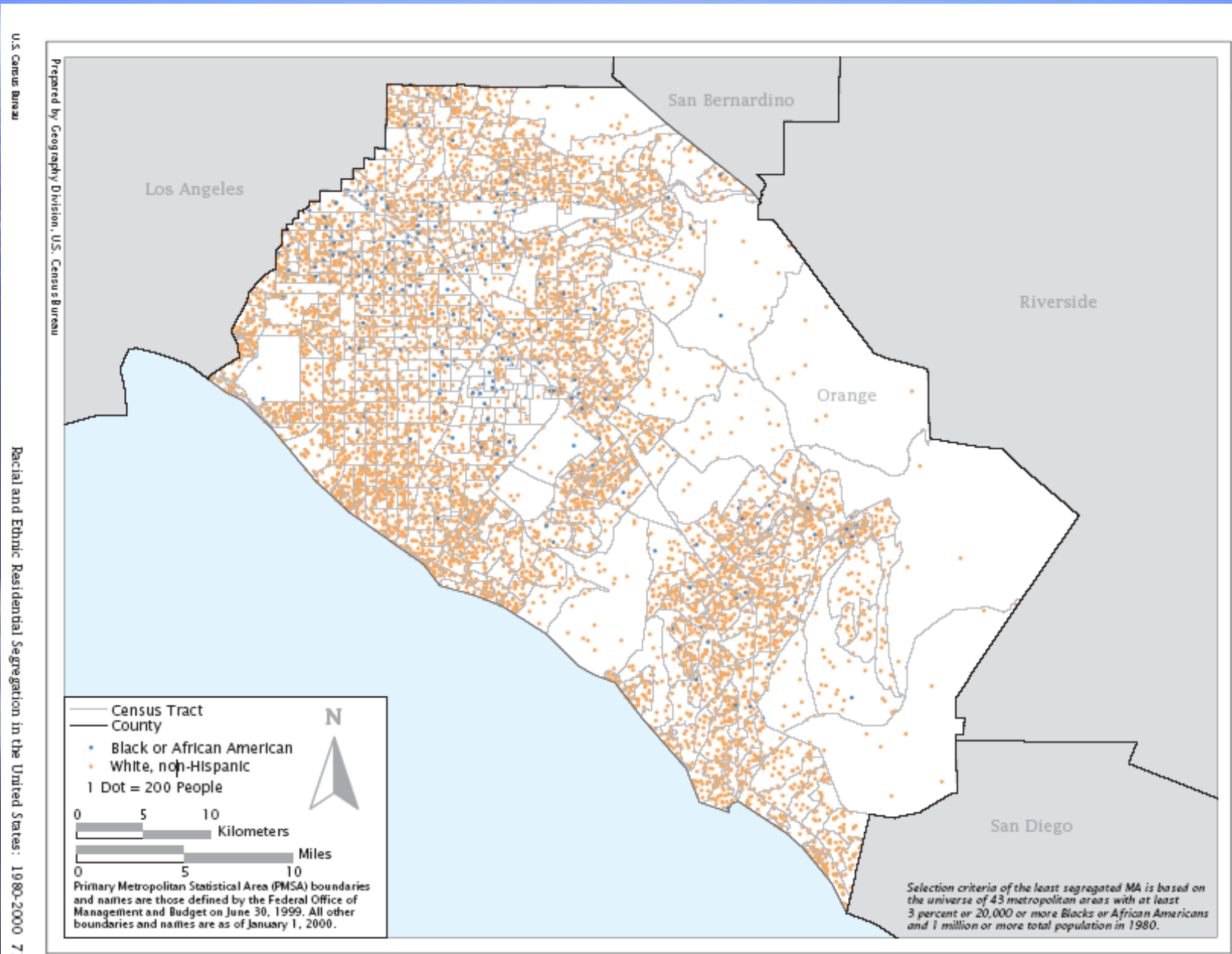
Crime Map
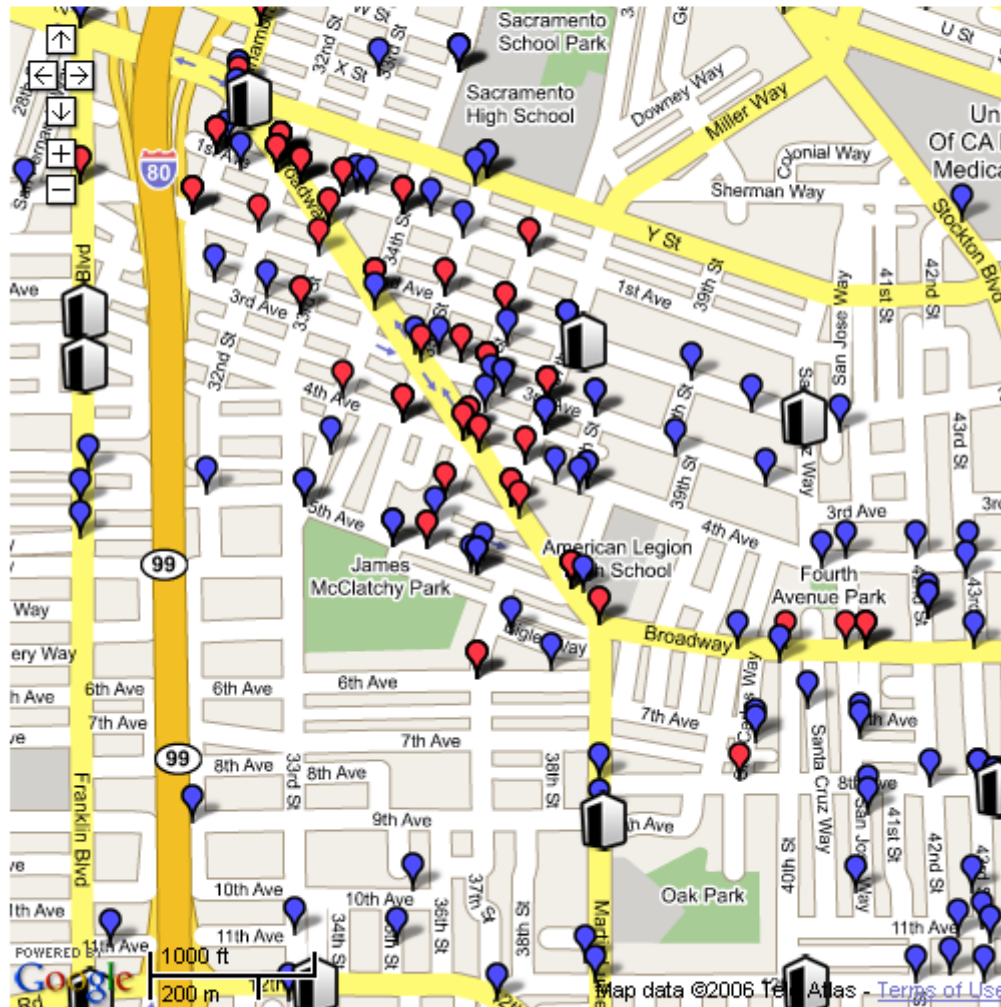
Legend / Toggles

- ☑ Stores
- ☑ Drug Crimes
- ☑ Prostitution Crimes
- ☐ Robbery Crimes

Using this map

The map requires a large amount of computer power and may take as much as 20 seconds to appear. If you have an older computer, you may not be able to use the zooming features or display all of the map points. We recommend that you close all your browser windows when you are finished viewing the map.

Community Health Indicators

Indian Community Health Profile Project (NW Portland)

Socio-demographic

- Rate of high school graduation.
- Proportion of children (0-18) who live with both natural parents

Health status

- Prevalence of diabetes among all ages.
- Rate of hospitalization (discharges per 1,000) for injuries and poisonings.
- Rate of years of potential life lost (per 1,000).
- Prevalence of caries (tooth decay) in 3-4 year old and 7-8 year old children.

Mental health and functional status

- Average number of healthy days for adults and seniors in the previous month.
- Health risk factors and positive health behaviors
- Prevalence of children (2-16) who have a weight associated with good health
- Percentage of pregnancies with prenatal care beginning in the first trimester.
- Prevalence of alcohol or other drug use among adolescents.
- Prevalence of tobacco use among adolescents and adults.
- Proportion of adults who regularly engage in physical activity of a duration and intensity sufficient to promote health.
- Number and rate of confirmed cases of abuse and neglect in children (0-18).

Environment

- Presence of tribal ordinances requiring auto safety restraint use,

ER Visit Rate (per 10,000)

[0.5 mile Resolution]

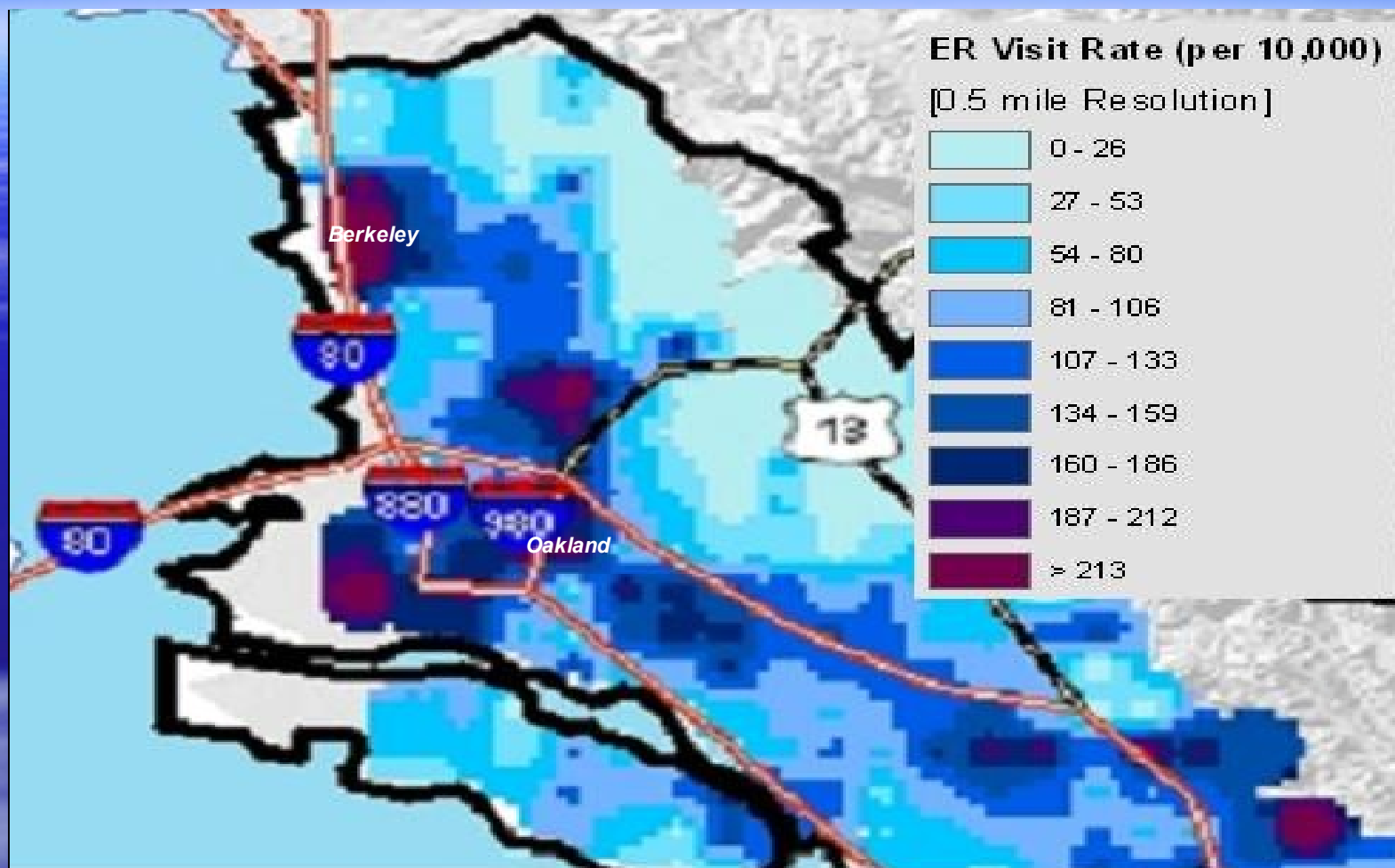|	
	0 - 26
	27 - 53
	54 - 80
	81 - 106
	107 - 133
	134 - 159
	160 - 186
	187 - 212
	≥ 213

Figure 1. Density estimation mapping of Emergency Room visits for childhood asthma in Alameda County, CA, 2001

Selected City: Oakland

ZOOM OUT ☐ ☐ ☐ ☐ ☐ ZOOM IN

Zoom Level: City

Print Map   HELP

CLICK TO GO NORTH

CLICK TO GO WEST

CLICK TO GO EAST

CLICK TO GO SOUTH

Emeryville   Piedmont   Oakland   Alameda   S13
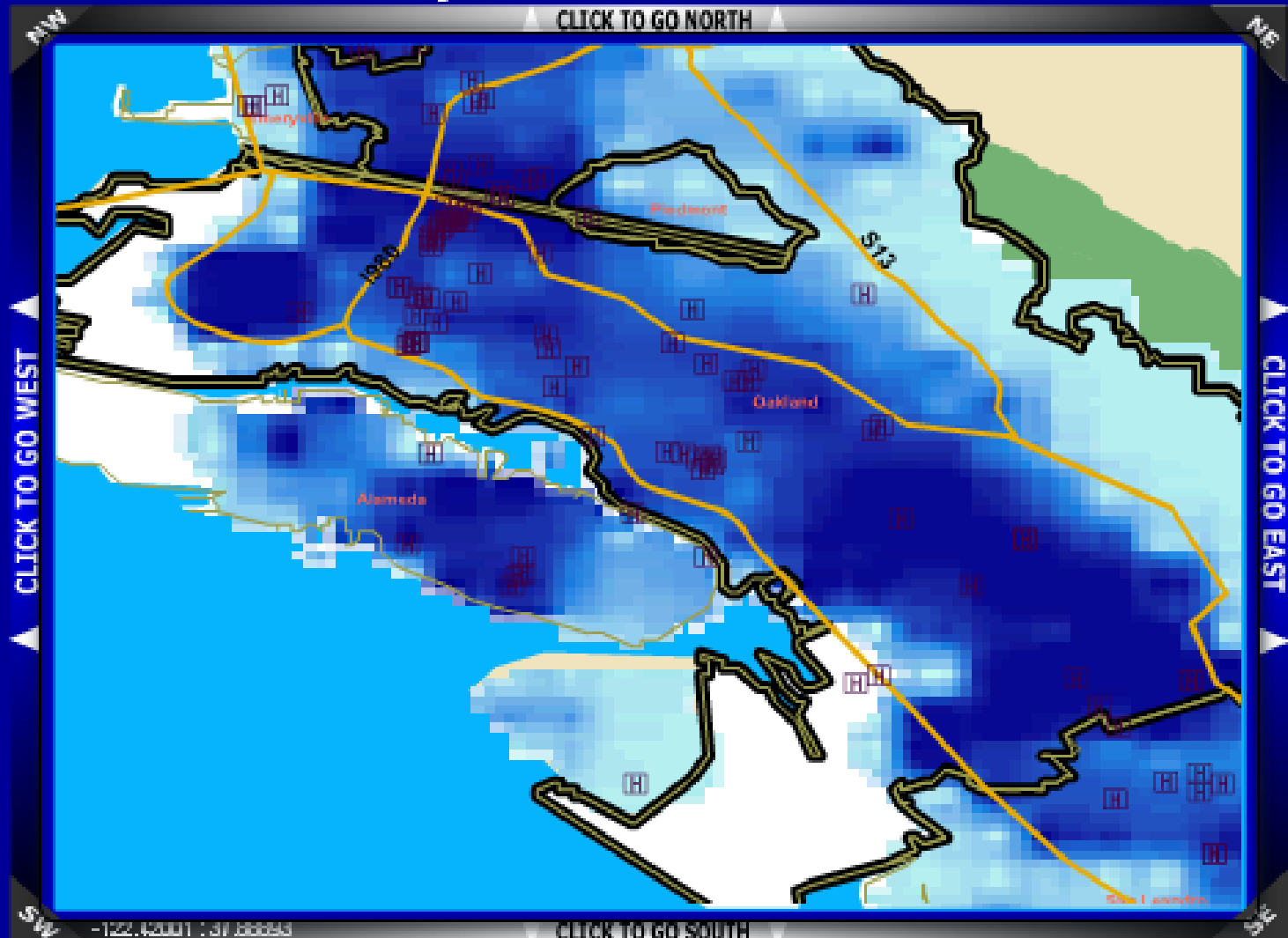
Demographics   Labor Force   Income and Poverty   Housing   Home Mortgages

SELECTED DATA SET - BIRTH OUTCOMES: TERM LOW BIRTHWE

Google | Search | 187 blocked | ABC Check | AutoLink | AutoFill | Options

Selected Zip Code: 94560 in the city of Newark

Mapping | **Query**

Locate on Map:

Zip Codes

94555
94560
94566

ZOOM OUT | ZOOM IN

Zoom Level: County

Print Map | HELP

CLICK TO GO NORTH

S24
S13
I680
I580
I880
S92

CLICK TO GO WEST

CLICK TO GO EAST

Newark

CLICK TO GO SOUTH

-121.88422 : 37.18632
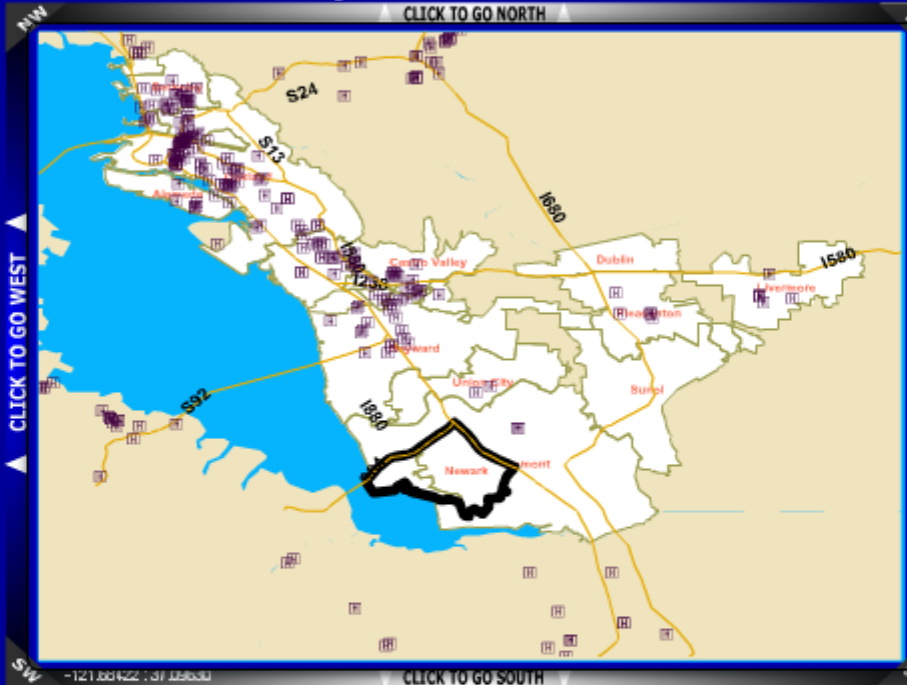
Map Layers:

- [H] ☑ Health Care Facilities
- ☐ Schools
- [X] ☐ Toxic Release Inventory
- ☐ Zip Codes
- ☐ Census Tracts
- ☐ Block Groups
- ☐ Oakland Council Districts
- ☐ CAPE Boundaries
- ☐ Traffic Volumes
  - — 0 - 25,000 cars
  - 25,001 - 50,000 cars
  - 50,001 - 75,000 cars
  - 75,001 - 100,000 cars
  - 100,001 - 137,000 cars

About Map Layers

☑ Selected Area

Demographics | Labor Force | Income and Poverty | Housing | Home Mortgages | Birth Outcomes | Asthma Outcomes

SELECTED DATA SET - DEMOGRAPHICS: LANGUAGE AND IMMIGRATION

County: Alameda | City: Newark | Zip Code: 94560 | Print Data

DataCategory	ZipCode	pct Zip	City	pct City	County	pct County
Born in California	21666	51.0%	21666	51.0%	685548	48.8%
Foreign born	13422	31.6%	13422	31.6%	382319	27.2%
Foreign born population that arrived since 1990	5102	38.0%	5102	38.0%	162607	42.5%

INFO ALAMEDA COUNTY | View Data Source and More Information | geotlash explorer

Internet

Future work on community vulnerability measures

- Addition to content work group?
  - Can they be measured in a standardized way nationally?
  - How to control for community factors?
    - Multilevel analysis
    - Spatial regressions
  - Will controlling for community factors affect the magnitude of the relationship between environmental pollutants and health outcomes?